

REMARKS

Reconsideration and allowance in view of the foregoing amendments and the following remarks is respectfully requested.

Claims 1-18 remain pending in the application.

Applicants appreciatively note that claims 9-11 are allowable and are objected to as being dependent upon a rejected base claim. Applicants respectfully request this be held abeyance pending allowance of independent claim 1.

Abstract

The Abstract of the present application is objected to because of the improper language. In response, a corrected Abstract, which meets the requirement as set forth in MPEP 608.01(b), is attached hereinwith. Accordingly, the objection to the Abstract should be withdrawn.

Specification

The Specification of the present application is objected to, because the Specification lacks proper layout. In response, each section of the Specification of the present application has been titled and meet the requirements as set forth in 37 CFR 1.77(b). Accordingly, the objection to the Specification should be withdrawn.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84 (p)(5). More specifically, Fig 3B is objected to, because the reference sign "38" from Fig. 3b is not mentioned in the description. In response, the Specification has been amended to correct

the mistake that the reference sign “38” is omitted after “conductive adhesive” in Page 7, Line 13 of the Specification.

In addition, the Drawings are further objected, because “heterogeneously thinning the structure by nonselective surface treatment of the polymer layer and at least one passive component” is stated as failing to be shown in Drawings. Applicants respectfully traverse this objection. As illustrated in Fig. 1, step 16 directs to “THINNING BY HETEROGENEOUS SURFACE TREATMENT.” Accordingly, the features of claim 1 are completely shown in the Drawings.

The Drawings are further objected, because “rectifying the polymer layer prior to the step of redistributing the terminals, to calibrate the thickness of the layer to a predetermined value and render the surface of said layer substantially flat and parallel to the support” is not shown in the Drawings. Applicant respectfully traverses this objection. As illustrated in Fig 1, Step 13 directs to “RECTIFYING THE LAYER.” Accordingly, the features of claim 2 are completely shown in Drawings.

Claim 13 recites the following features, wherein “producing thinned heterogeneous elementary components by the method as claimed in claim 12, the terminals being redistributed in particular toward the periphery” is illustrated at Step 15 of Fig. 1;

“stacking and bonding the heterogeneous components” is illustrated at Step 51 of Fig. 5;

“coating the stack with the aid of a polymer material” is illustrated at Step 52 of Fig. 5;

“cutting the material to form, around said stack, a parallelepipedal block whose faces will expose the peripheral contacts of the active and passive components” is illustrated at Step 53 of Fig. 5;

“depositing a metallization layer on at least a part of the faces” is illustrated at Step 54 of Fig. 5;

“forming an interconnection network of the conductors by laser etching the metallization layer on the faces of the block” is illustrated at Step 55 of Fig. 5.

Fig. 5 is objected to, because Fig. 5 is stated as failing to be designated as Prior Art. Applicants respectfully traverse this objection, because Fig. 5 does not illustrate what is old. In fact, Fig. 5 illustrate an interconnection method for producing three-dimensional thinned heterogeneous components, which is one of the embodiments of the application and is described in page 11, line 35 – page 13, line 10. Accordingly, the objection to claim 5 should be withdrawn.

Based on the forgoing amendments and remarks, all of the objections to the Drawings of the present application have been overcome.

Claim Rejection – 35 USC § 112

Claims 1-3 are rejected under 35 U.S.C. 112, 2nd paragraph as being indefinite. More specifically, the last step recited in claim 1, the “heterogeneously thinning” is stated as being indefinite in view of “a first step of heterogeneously thinning” recited in claim 3. Applicants respectfully traverse this rejection, because the thinning step of claim 1 is different from “a first step of heterogeneously thinning” of claim 3.

As described in page 8, line 23 – page 9, line 2 of the Specification as originally filed, the rectification step comprises “a first step of heterogeneously thinning”, so as to render the surface of the layer substantially plane and cut the thickness of the structure to a predetermined value. However, the “heterogeneously thinning” recited in claim 1 is the

last step of the method, which is employed after redistributing the terminals between the components towards the periphery (See, for example, page 9, line 33 – page 10, line 17).

In order to more clearly recite the claimed subject matter, Applicants have amended claims 2 and 3 to recites a “rectifying and pre-thinning step” and “rectifying and pre-thinning step comprises thinning the layer by nonselective surface treatment of the polymer layer and the passive component.” Accordingly, Applicants respectfully request the rejection of claims 1-3 to be withdrawn.

Claim Objection

Claims 1 and 17 are objected to because of the informalities. In response, Applicant has amended the claims in accordance with the Examiner’s helpful suggestions to overcome the informalities.

Claims 2-4 are objected to because of the noted informalities. In response, Applicants has amend claims 2 and 3 to recite a “rectifying and pre-thinning step.” Applicants respectfully submit the term, “rectifying and pre-thinning step”, is clear and definite.

Accordingly, the informalities of claims 1, 2-4 and 17 have been overcome, and the objections to claims 1, 2-4 and 17 should be withdrawn.

Claim Rejection – 35 USC § 102

Claims 1-4, 6 -7 and 14 -15 are rejected under 35 U.S.C. 102 (b) as being anticipated by Fillion et al (US 5,497,003; hereinafter “*Fillion*”). Applicants respectfully

traverses this rejection for the reasons discussed below.

Claim 1 recites a method for the interconnection of active and passive components in 2 or 3 dimensions. This method directs particular to thinning active components of the “chip” type semiconductor. In stacking components in three dimensions, it is becoming possible to stack thinned chips of 150, 100 or even 50 microns. This is not compatible with the 500-600 microns thickness of the passive components, such as contemporary ceramic capacitors.

The method recited in claim 1 provides a solution for interconnection of active and passive components, which is particularly applicable to the interconnection of chip-type active components and ceramic capacitors and thinning the heterogeneous components in two or three dimensions. The method is based on simultaneously thinning the active and passive components coated in a polymer layer by a surface treatment, i.e. applied non-selectively both to the passive and active components and to the polymer layer coating them. As described in the Specification, this method does not significantly affect the performance of the passive components, such as the performance of the ceramic capacitors.

Fillion disclose a method for fabricating an IC module substrate which includes material molding around semiconductor chips. The components include semiconductor components 14 and discrete components, such as capacitor 20, resistor, inducer, etc. These semiconductor and discrete components do not have the same thickness (col 4, lines 59-60 and col 5, lines 12-16).

The thinning step disclosed by *Fillion* relates merely to semiconductors components

14. Nowhere does *Fillion* disclose, teach or suggest a method which includes a step of thinning a passive component (not only the polymer layer) by surface treatment.

Base on the aforementioned reasons, *Fillion* fails to disclose all of the claimed limitations of claim 1, in particular, “thinning the structure by nonselective surface treatment of the polymer layer and at least one passive component.” Accordingly, the rejection of claim 1 should be withdrawn.

Claims 2-4 and 6-7 recite additional, important limitations and should be patentable for the reasons discussed above with respect to claim 1 as well as on their own merits.

Claim 14 recite similar limitations as claim 1. Thus, claim 14 is patentable at least for the reasons discussed above with respect to claim 1. Accordingly, the rejection of claim 14 should be withdrawn.

Claim 15 recites additional, important limitations and should be patentable for the reasons discussed above with respect to claim 14 as well as on its own merits.

Claim Rejection – 35 USC § 103

Claims 5, 12 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Fillion* and further in view of Nakamura et al. (US Pcb 2002/0151103 A1; hereinafter “*Nakamura*”). Applicant respectfully traverses this rejection.

Nakamura fails to cure the deficiency of *Fillion*. Applicants respectfully submits that nowhere dose Nakamura teach or suggest thinning a passive component by surface treatment.

Claims 5 and 12 recite additional, important limitations and should be patentable for the reasons discussed above with respect to claim 1 as well as on their own merits.

Claim 16 and 17 recite additional, important limitations and should be patentable for the reasons discussed above with respect to claim 14 as well as on their own merits.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fillion and further in view of Hirano et al (US Pcb 2002/0222335 A1; hereinafter "Hirano"). Applicants respectfully traverse this rejection.

Claim 8 recites additional, important limitations and should be patentable for the reasons discussed above with respect to claim 1 as well as on its own merits.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fillion and further in view of Oka et al (US Pcb 2002/0222335 A1; hereinafter "Oka"). Applicants respectfully traverse this rejection.

All objections and rejections having been addressed, it is respectfully submitted that the present application should be in condition for allowance and a Notice to that effect is earnestly solicited.

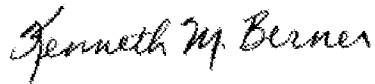
Early issuance of a Notice of Allowance is courteously solicited.

The Examiner is invited to telephone the undersigned, Applicant's attorney of record, to facilitate advancement of the present application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

LOWE HAUPTMAN HAM & BERNER, LLP

A handwritten signature in black ink that reads "Kenneth M. Berner". The signature is written in a cursive, flowing style.

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